

## IT IS CLAIMED:

1. A method for dewatering biological sludge that has been digested by a thermophilic digestion process comprising:

adding polymeric quaternary ammonium compounds, as primary component, to the biological sludge; and

adding polyacrylamide to the biological sludge;

such that any combinations of the polymeric quaternary ammonium compounds and of the polyacrylamides enhance dewatering of the sludge.

2. The method for dewatering biological sludge according to claim 1, wherein the polymeric quaternary ammonium compounds are from di-allyl di-methyl ammonium chloride (DADMAC) family.

3. The method for dewatering biological sludge according to claim 1, wherein the polymeric quaternary ammonium compounds are from epichlorohydrin di-methyl amine (epi-DMA) family.

4. The method for dewatering biological sludge according to claim 1, wherein the polymeric quaternary ammonium compound is added directly to the sludge and, upon formation of microflocs of the sludge from the polymeric quaternary ammonium compound, a cationic polyacrylamide is added to form a floc that dewateres the sludge.

5. The method for dewatering biological sludge according to claim 4, wherein the <sup>polymeric</sup> ~~polymeric~~ quaternary ammonium compound and the cationic polyacrylamide are in an approximately 1:1 ratio. with the cationic polyacrylamide having a higher molecular weight than the polymeric quaternary ammonium compound does.

6. The method for dewatering biological sludge according to claim 4, wherein ratios of the polymeric quaternary ammonium compound with respect to the cationic polyacrylamide range from about 1:10 to about 20:1.

7. The method for dewatering biological sludge according to claim 4, wherein polymer concentration to solids ratio of total polymer dosage requirement in relationship to percentage of solids component of the sludge is between about 50 ppm:1 percent and about 300 ppm:1 percent.

8. The method for dewatering biological sludge according to claim 1, wherein the polymeric quaternary ammonium compound is added directly to the sludge, in an amount sufficient to cause formation of a cationic overcharge within a developed microfloc system, and an anionic polyacrylamide is then added for final floc formation.

9. The method for dewatering biological sludge according to claim 8, wherein the polymeric quaternary ammonium compound is added to the sludge in a quantity that is approximately 20 to approximately 30 percent higher than any quantity of the polymeric quaternary ammonium compound that is added to claim 4.

10. The method for dewatering biological sludge according to claim 8, wherein the polymeric quaternary ammonium compound and the anionic polyacrylamide are in an approximately 10:1 ratio, with the anionic polyacrylamide having a higher molecular weight than the polymeric quaternary ammonium compound does.

11. The method for dewatering biological sludge according to claim 10, wherein the anionic polyacrylamide is about 40% anionic.

12. The method for dewatering biological sludge according to claim 8, wherein ratios of the polymeric quaternary ammonium compound to the anionic polyacrylamide range from about 1:10 to about 20:1.

13. The method for dewatering biological sludge according to claim 8, wherein polymer concentration to solids ratio of total polymer dosage requirement in relationship to percentage of solids component of the sludge is between approximately 50 ppm:1 percent and approximately 300 ppm:1 percent.

14. The method for dewatering biological sludge according to claim 1, wherein the biological sludge is mixed with primary sludge.

*Sub-A2* → 15. A composition for dewatering biological sludge according to claim 1 comprising polymeric quaternary ammonium compounds, as primary component, and polyacrylamide, said components being present in the composition in a ratio to enable the composition to function as an agent for dewatering biological sludge from a thermophilic digestion process.

*Sub-B3* → 5 16. The method for dewatering biological sludge according to claim 1, wherein the polyacrylamide and the polymeric quaternary ammonium compounds are used in solution or in dry form.

*add A3* →  
*add B4* →  
*add D1* →